



US005600775A

United States Patent

[19]

King et al.**Patent Number:** 5,600,775**Date of Patent:** Feb. 4, 1997**[54] METHOD AND APPARATUS FOR
ANNOTATING FULL MOTION VIDEO AND
OTHER INDEXED DATA STRUCTURES****[75] Inventors:** Philip S. King; Hendrik W. Nelis, both of San Francisco, Calif.**[73] Assignee:** emotion, inc., Palo Alto, Calif.**[21] Appl. No.:** 296,535**[22] Filed:** Aug. 26, 1994**[51] Int. Cl.⁶** G06F 15/00**[52] U.S. Cl.** 395/806; 395/761**[58] Field of Search** 395/154, 153, 395/155, 156, 144, 147, 145, 157, 160, 161**[56] References Cited****U.S. PATENT DOCUMENTS**

4,616,336	10/1986	Robertson et al.	395/147
5,309,359	5/1994	Katz et al.	364/419.19
5,404,295	4/1995	Katz et al.	364/419.19
5,428,774	6/1995	Takahashi et al.	395/600
5,442,744	8/1995	Piech et al.	395/154
5,502,727	3/1996	Catanzaro et al.	370/94.2
5,513,306	4/1996	Mills et al.	395/148
5,517,652	5/1996	Miyamoto et al.	395/800
5,524,193	6/1996	Covington et al.	395/154
5,550,965	8/1996	Gabbe et al.	395/154

OTHER PUBLICATIONS

Lee et al., "Video Indexing—An Approach based on Moving Object and Track", Proceedings of Storage and Retrieval for Image and Video Databases, pp. 25–36. Feb. 1993.

Nagasaka et al., "Automatic Video Indexing and Full-Video Search for Object Appearances", Visual Database Systems, (Knuth et al., eds.), pp. 113–126. Jan. 1992.

Weber et al., "Marquee: A Tool for Real-Time Video Logging", CHI '94. Apr. 1994.

Minneman et al., "Where Were We: making and using near-synchronous, pre-narrative video", Multimedia '93, pp. 1–11. Dec. 1993.

Phillips, "MediaView: a general multimedia digital publication system", Comm. of the ACM, v. 34, n. 7, pp. 75–83. Jul. 1991.

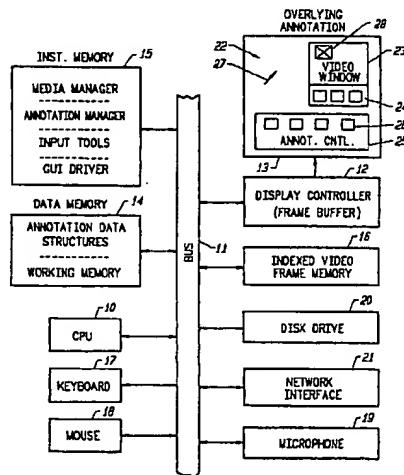
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[57] ABSTRACT

Full motion digital video frames, or other indexed data structures, are annotated with text, graphics, and digital audio without modifications to the original video information. The video and annotations are stored separately. An indexing scheme relates the annotations to the video frames. On full motion video playback, the annotations are displayed on the originally annotated frames. The technique involves displaying the file of indexed data structures using a file display routine, and selecting in response to user input an indexed data structure to be annotated from the file of indexed data structures being displayed. Next, an annotation data structure is created in response to user input using an annotation routine without modifying the selected data structure. The annotation data structure includes a graphical element for display overlaying the selected data structure and an indication of an index value for the selected data structure. The annotation data structure is stored in an annotation memory apart from the file of indexed data structures. During playback, the annotation memory is monitored to detect annotation data structure for indexed data structures currently being displayed. If an annotation data structure is detected for the current indexed data structure, a graphical element overlies the indexed data structure on the display without modifying the indexed data structure. Text process documents can be handled much in the same manner. Also, annotation from several users may be merged and viewed in one batch.

48 Claims, 8 Drawing Sheets

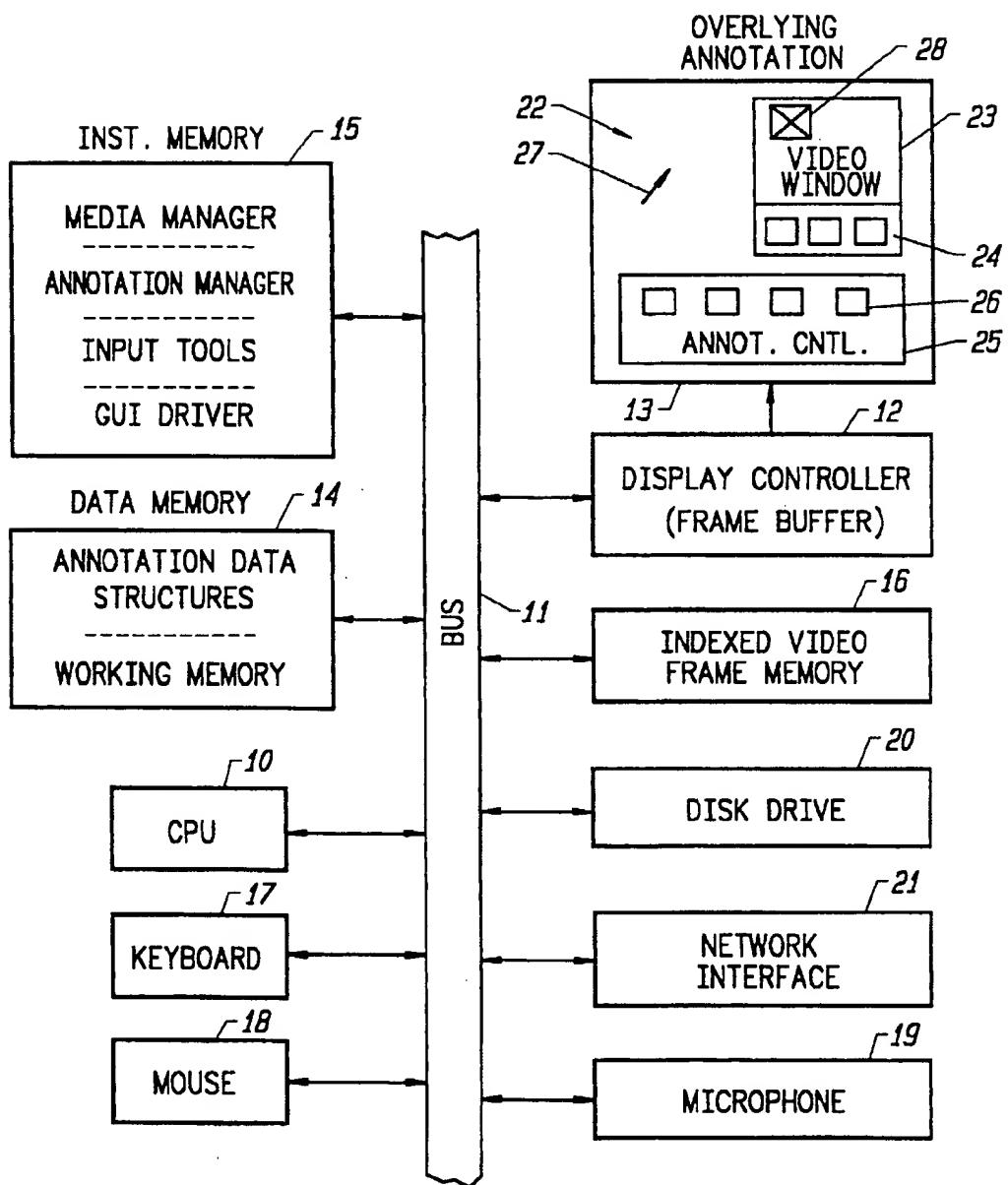


FIG. 1

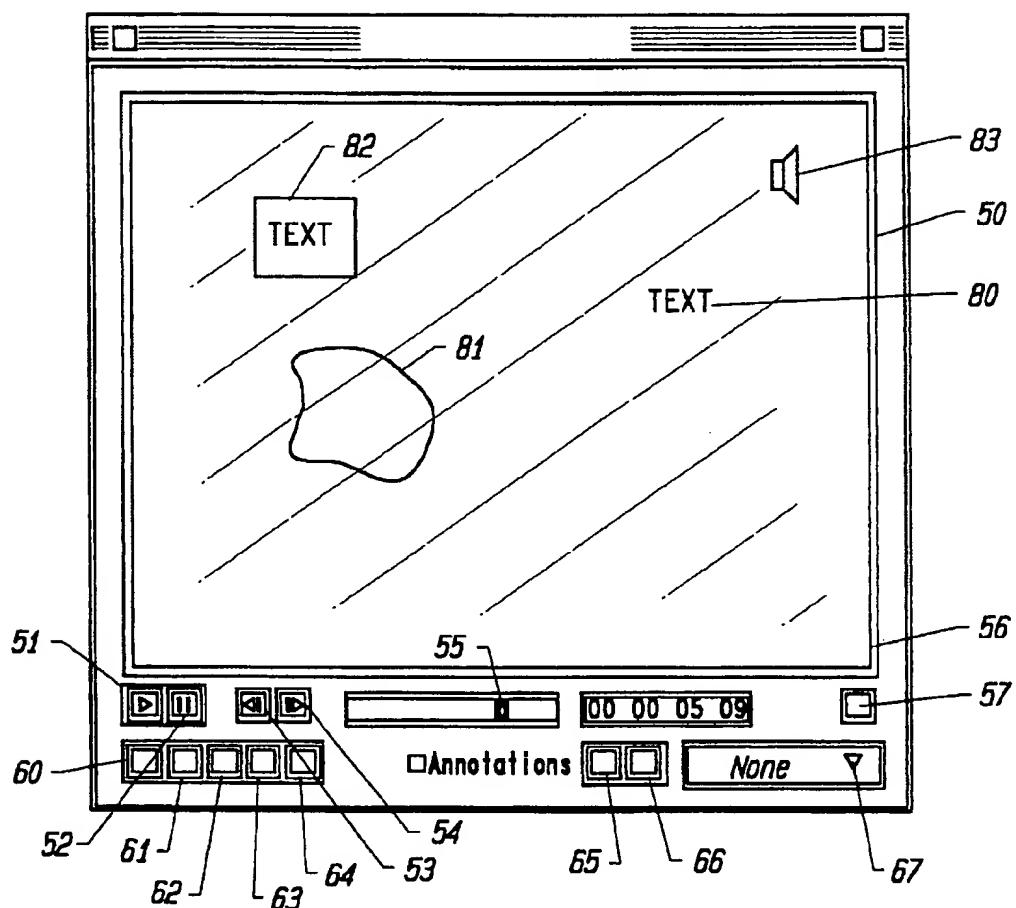


FIG. 2

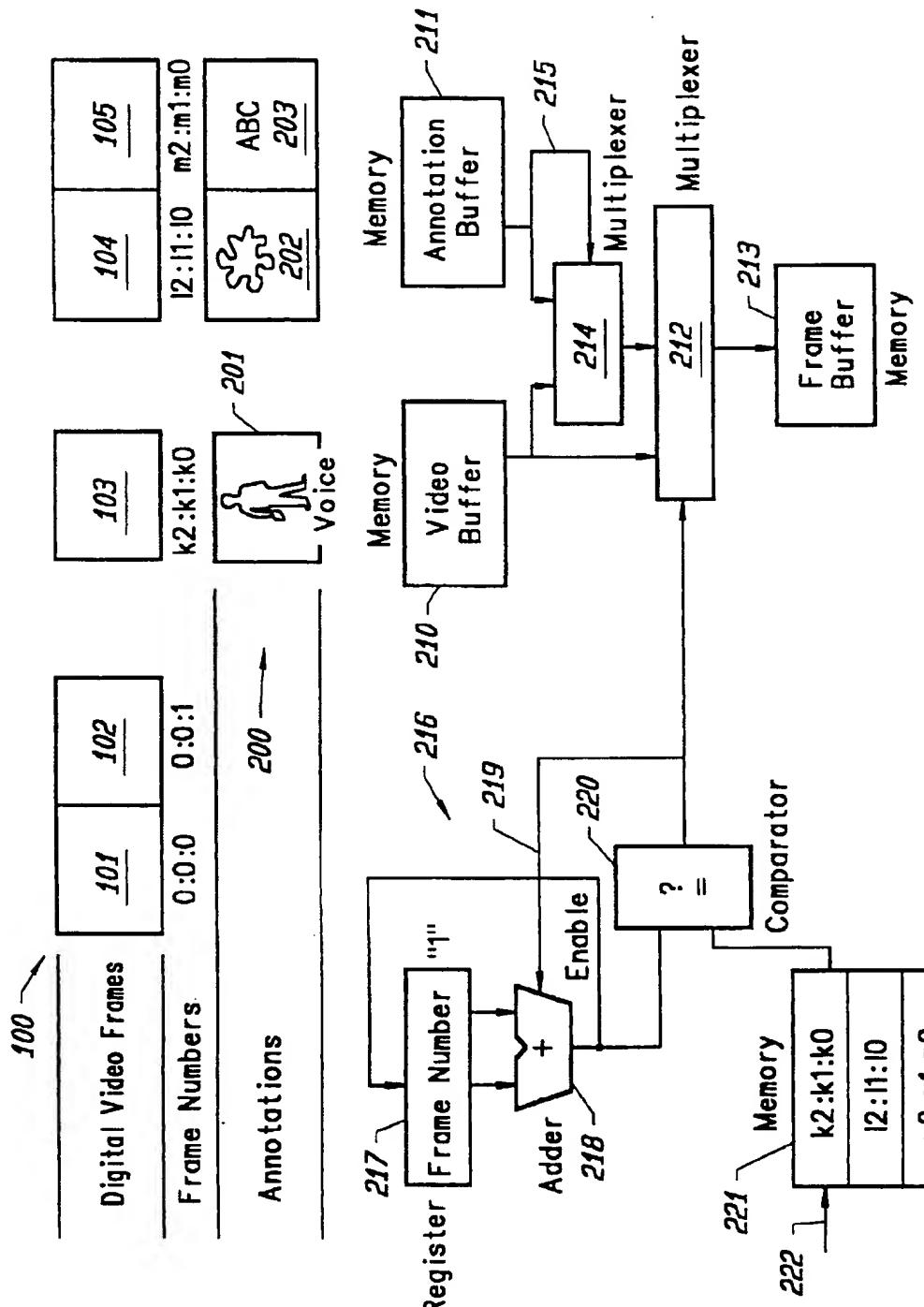


FIG. 3

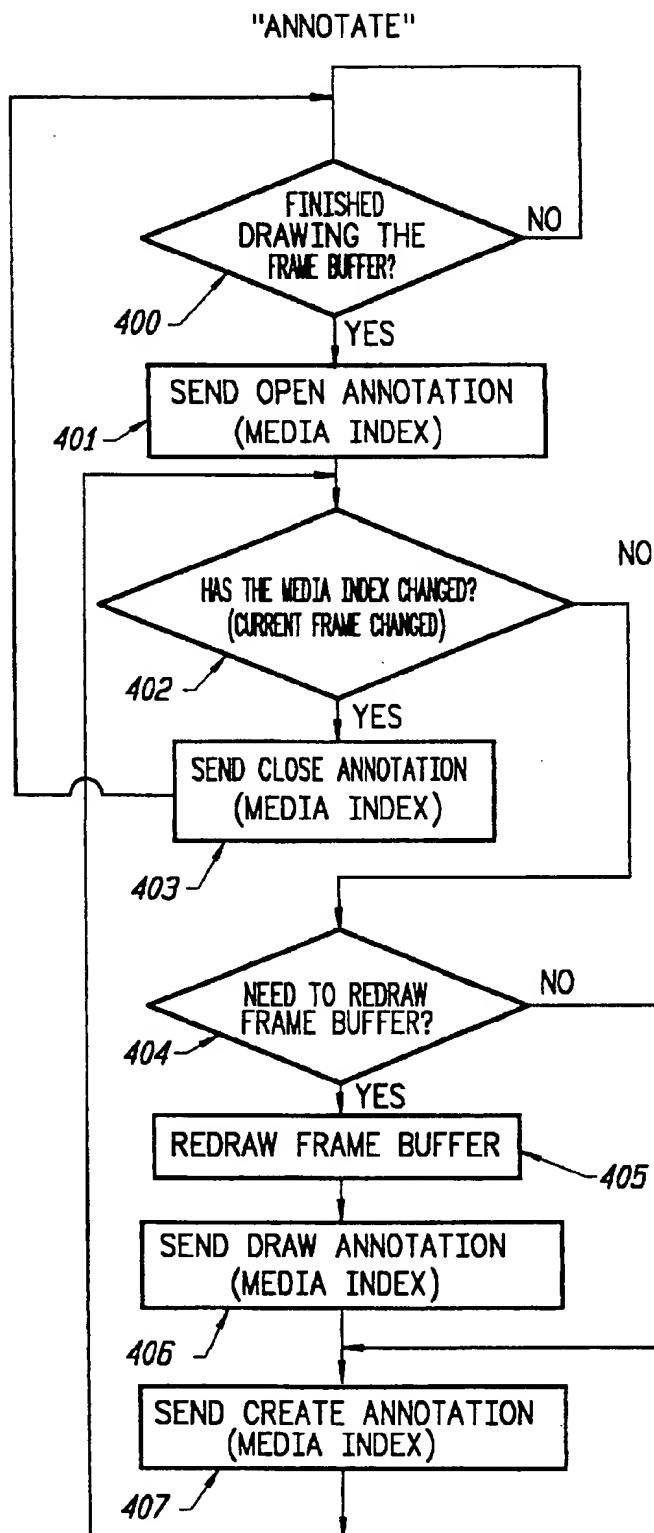


FIG. 4

"CREATE ANNOTATION (MEDIA INDEX)"

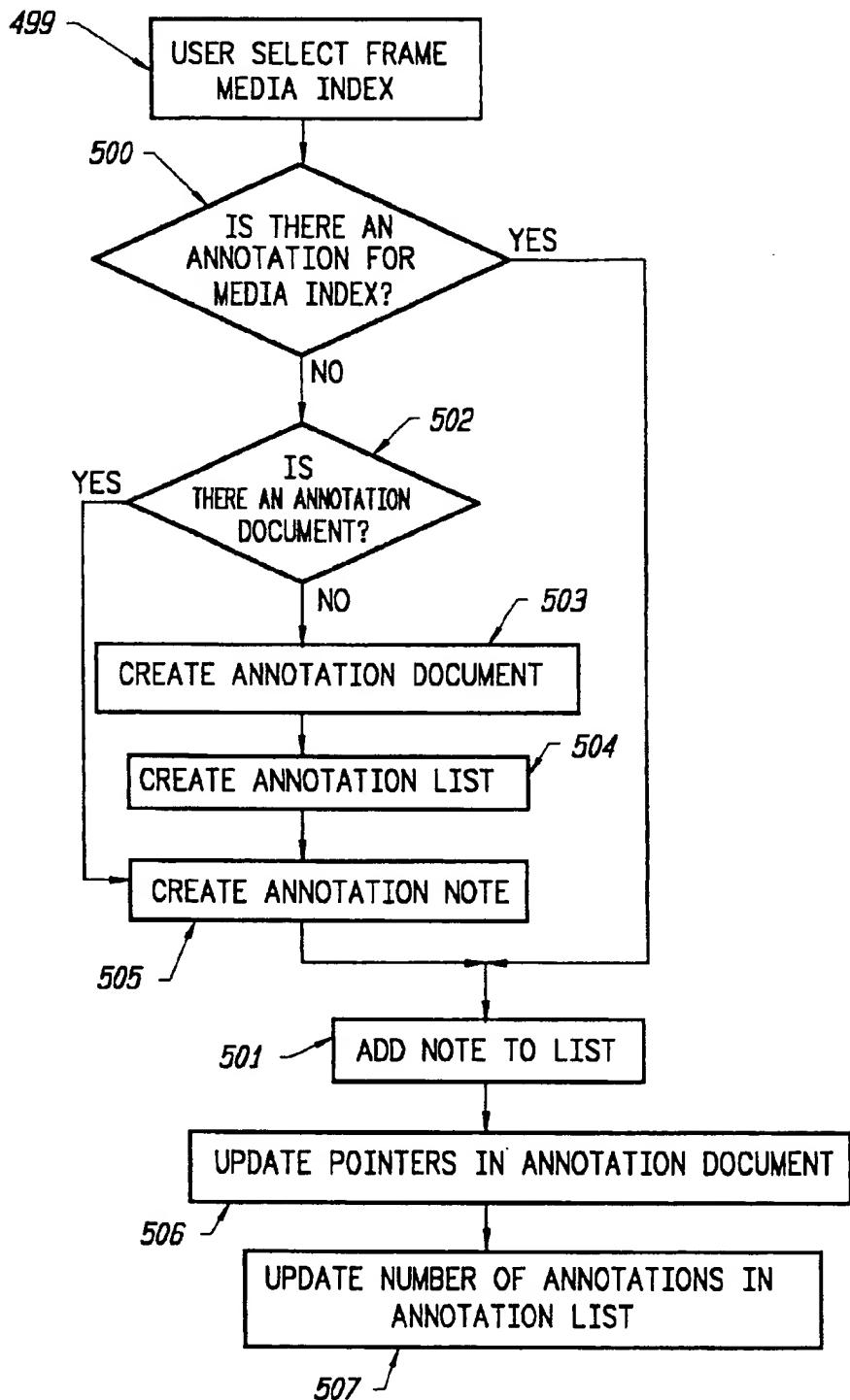


FIG. 5

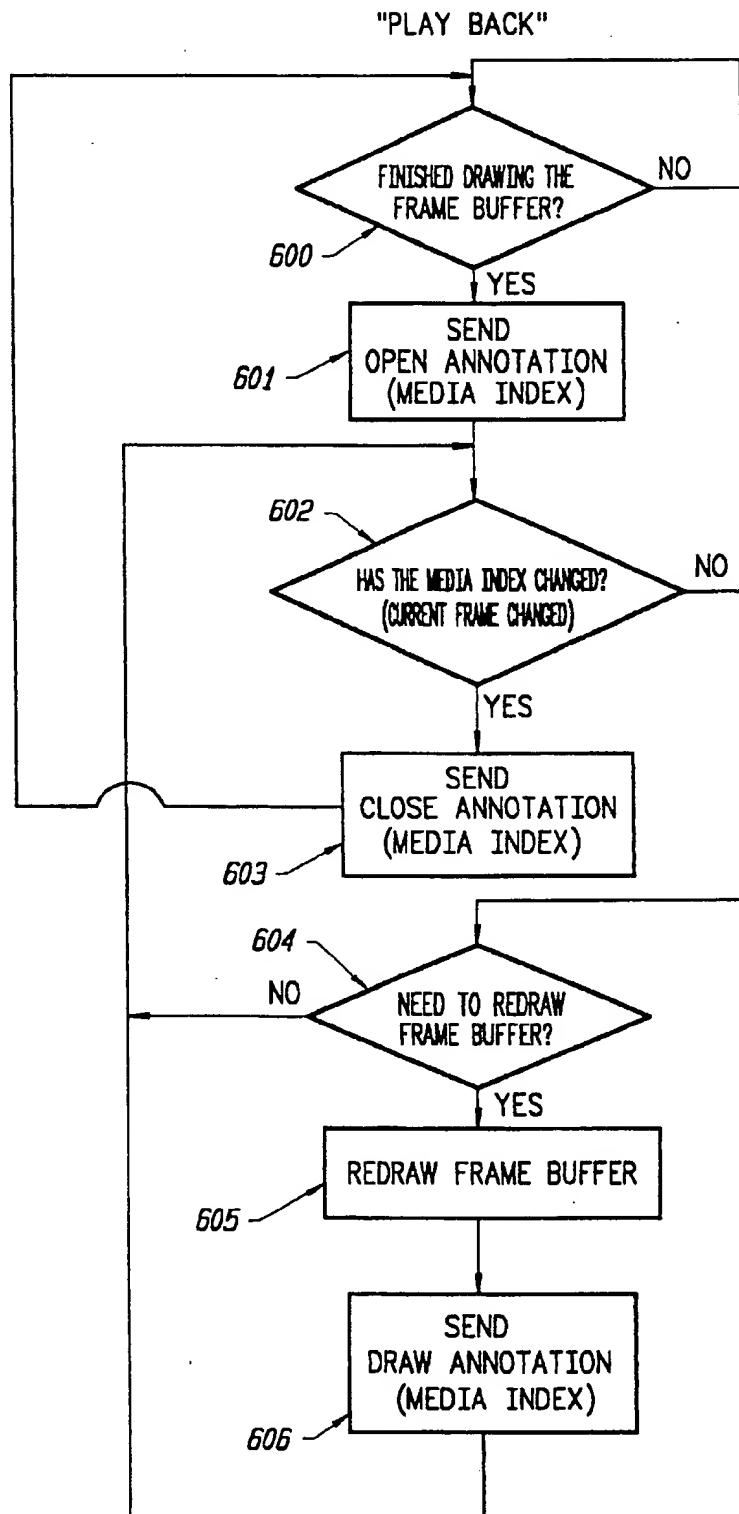


FIG. 6

"OPEN ANNOTATION (MEDIA INDEX)"

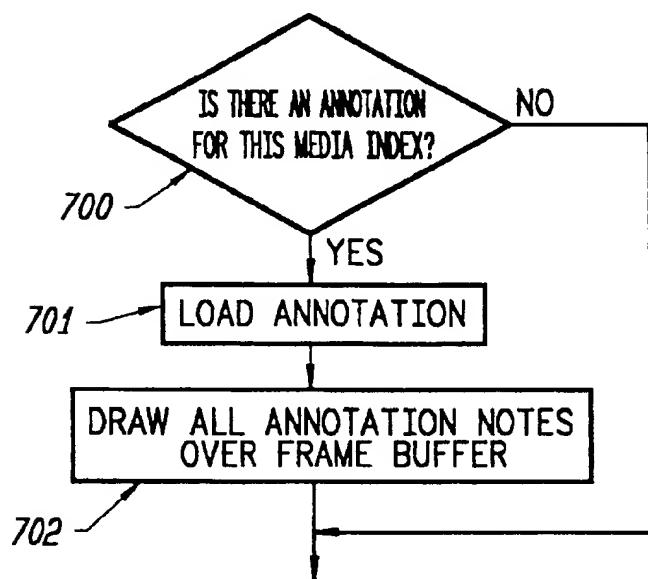


FIG. 7

"DRAW ANNOTATION (MEDIA INDEX)"

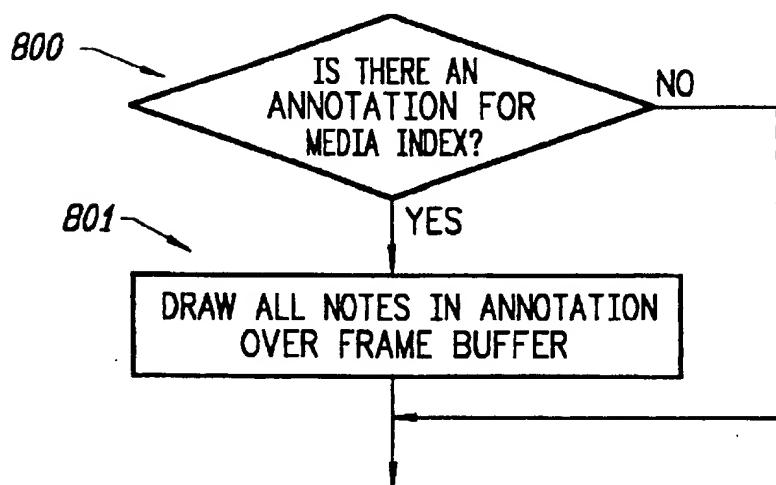


FIG. 8

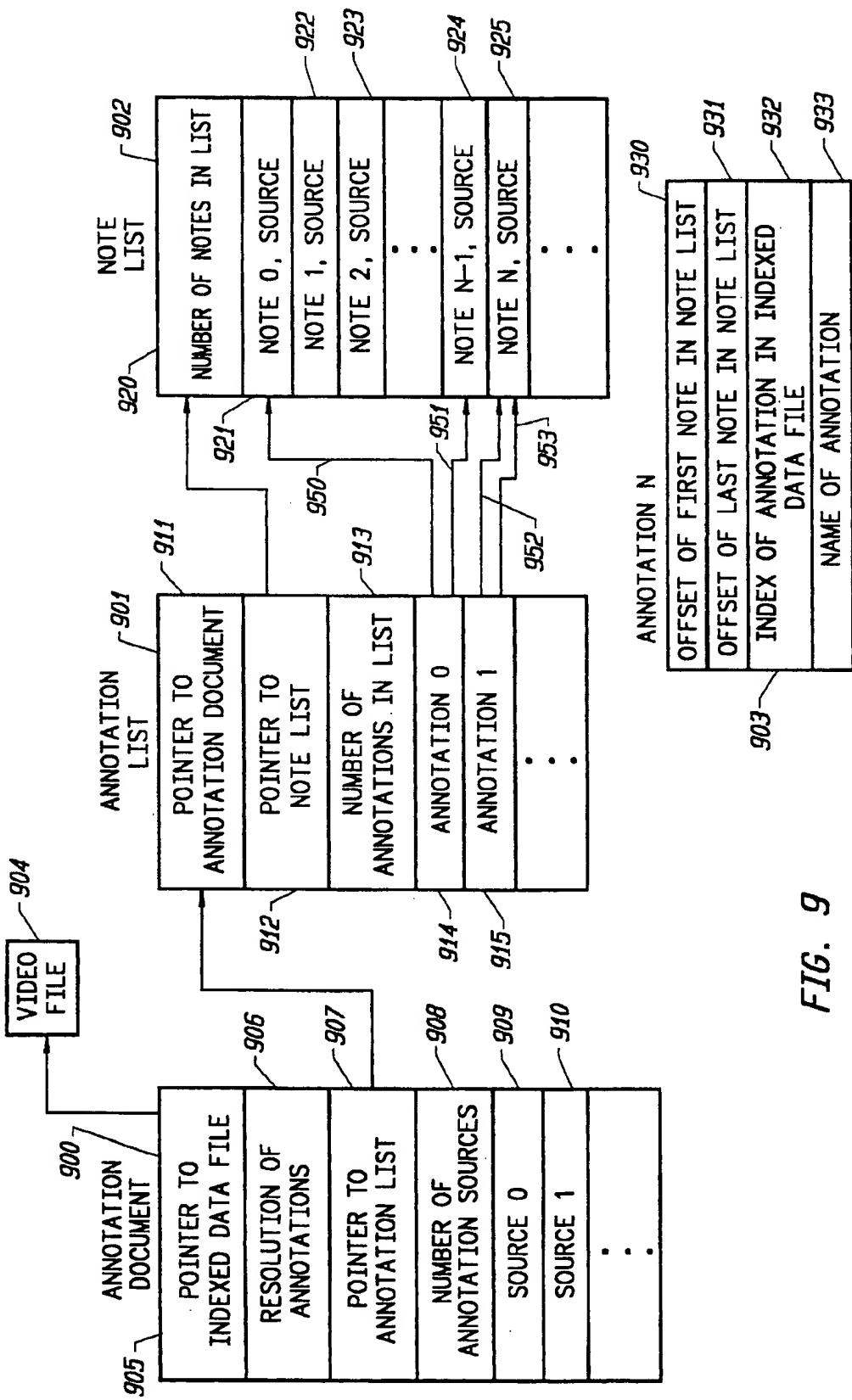


FIG. 9